C. 1985 by
ARTI GRAFICHE RICORDI
Prodotto dalla Enda S.r.l.

VOLUME 3

Questo terzo volume completa l'argomento della GRAFICA.
Questi i temi principali:
- i nuovi segni grafici
- lo schermo ad alta risoluzione
- la grafica geometrica

All'interno del programma, tanti esempi pratici che illustrano gli argomenti e i concetti spiegati, facilitando la comprensione e l'apprendimento.

Il libretto contiene anche altri listati che utilizzano la grafica ad alta risoluzione, per la creazione di istogrammi tridimensionali, onde concentriche, dimostrazione di cerchi, ed altro.

Definizione caratteri (omino, quadrato) CBM 64

```
4050 poke53280,0:poke53281,0:print"{clr}{down}"tab(11)
                                        "attendi un attimo{down}{down}{down}{down}{down}"
4055 restore
4060 poke56334,peek(56334)and254
4065 poke1,peek(1)and251
4070 fork=0to63*8+7
4075 poke14336+k,peek(53248+k)
4080 nextk
4085 poke1,peek(1)or4
4090 poke56334,peek(56334)or1
4095 fork=58*8to59*8+7
4100 reada
4105 poke14335+k,a
4110 nextk
4115 poke53272,(peek(53272)and240)or14
4120 print"{clr}{down}{down}{down}"tab(17)"eccoli{down}{down}{down}{down}{down}"
4125 printtab(17)":      ;※"
4130 data24,24,60,90,24,24,20,54
4135 data255,129,129,129,129,129,129,255
4150 gety$:ify$=""then4150
4200 poke53272,21:poke53280,3:poke53281,9:end
```

Linea orizzontale CBM 64

```
6000 rem *** linea orizzontale ***
6240 fori=8192to16192:pokei,0:nexti:print"{clr}"
6260 poke53272,peek(53272)or8
6280 poke53265,peek(53265)or32
6290 fori=1024to2023:pokei,3:nexti
6300 base=8192
6320 forx=30to200:y=100
6340 riga=int(y/8)
6360 col=int(x/8)
6380 lin=y and 7
6400 bit=7-(x and 7)
6420 loc=base+riga*320+col*8+lin
6440 va=peek(loc) or 2↑bit
6460 poke loc,va
6480 nextx
```

Sinusoide CBM 64

```
400 rem *** sinusoide ***
500 fori=8192to16192:pokei,0:nexti:print"♥"
520 poke53272,peek(53272)or8
540 poke53265,peek(53265)or32
560 fori=1024to2023:pokei,3:nexti
580 base=8192
600 forx=0to319step0.5
620 y=int(90+80*sin(x/10))
640 row=int(y/8)
660 char=int(x/8)
680 line=y and 7
700 bit=7-(x and 7)
720 byte=base+row*320+char*8+line
740 pokebyte,peek(byte) or 2↑bit
760 nextx
```

Rettangolo CBM 64

```
1000 rem *** rettangolo ***
1260 fori=8192to16192:pokei,0:nexti:print"♥"
1280 poke53272,peek(53272)or8
1300 poke53265,peek(53265)or32
1320 fori=1024to2023:pokei,3:nexti
1340 base=8192
1360 forx=50to200:y=50:gosub1460:nextx
1380 fory=50to100:x=200:gosub1460:nexty
1400 forx=200to50step-1:y=100:gosub1460:nextx
1420 fory=100to50step-1:x=50:gosub1460:nexty
1440 goto1620
1460 riga=int(y/8)
1480 col=int(x/8)
1500 lin=y and 7
1520 bit=7-(x and 7)
1540 loc=base+riga*320+col*8+lin
1560 va=peek(loc) or 2↑bit
1580 poke loc,va
1600 return
1620 gety$:ify$=""then1620
1640 poke53265,peek(53265)and223:poke53272,21:print"♥"
```

Creatore di caratteri CBM 64

```
10 poke52,56:poke56,56:poke51,0:poke55,0
100 poke53280,8:poke53281,8:f=7
102 print"{home}{down*11}"chr$(14)tab(15)"{rvs on}ALLEGATO 2{rvs off}"
104 print"{rvs off}              CREATORE DI CARATTERI"
110 gosub3000:gosub4000
200 rem creatore di caratteri
220 print"{clr}"
240 forq=1320to1327:pokeq,100:pokeq+360,99:nextq
260 forq=55565to55572:pokeq,f:pokeq+360,f:nextq
280 forq=1359to1639step40:pokeq,103:pokeq+9,101:nextq
300 forq=55631to55911step40:pokeq,f:pokeq+9,f:nextq
320 printchr$(142);:input"{home}{down*7}{right*12}";a$
340 j=0:forx=8to15
360 forq=16to23
380 ifpeek(1024+x*40+q)=32thena=0:goto420
400 a=1
420 i=i+a*(2↑(23-q))
430 l(x-7,q-15)=a
440 nextq
460 j=j+1:m(j)=i:i=0
480 nextx:print"{home}{down*14}"tab(18);:gosub1000
600 gety$
610 ify$="v"thenpoke53272,21:goto800
620 ify$="c"thengosub2000:goto320
630 ify$="s"thenpoke53272,21:goto850
640 goto600
800 print"{clr}"chr$(142)"{rvs off}              dati del carattere:{rvs off}"
820 forq=1to8:printm(q);:nextq:end
850 print"{clr}"chr$(142)"{rvs off}nome dello sprite{rvs off}":inputno$
860 open1,4:print#1,"sprite: ";no$
870 forq=1to8:print#1,m(q);:nextq
880 print#1:close1:end
1000 g=0
1010 poke56334,peek(56334)and254
1015 poke1,peek(1)and251
1020 fork=0to63*8+7
1040 poke14336+k,peek(53248+k)
1060 nextk
1070 poke1,peek(1)or4
1075 poke56334,peek(56334)or1
1080 fork=63*8to63*8+7
1100 g=g+1
1120 poke14336+k,m(g)
1140 nextk
1160 poke53272,(peek(53272)and240)or14
1180 print"{home}{down*12}"tab(20)"?"
1600 return
2000 poke53272,21
```

```
2020 print"sqqqqqqq"chr$(142)
2040 printtab(9)"  ______________"
2060 printtab(9)" |              |"
2080 printtab(9)" |              |"
2100 printtab(9)" |              |"
2120 printtab(9)" |              |"
2140 printtab(9)" |              |"
2160 printtab(9)" |              |"
2180 printtab(9)" |              |"
2200 printtab(9)" |              |"
2220 printtab(9)"  ______________"
2300 forx=8to15
2320 forq=16to23
2340 ifl(x-7,q-15)=1thenb=81:goto2380
2360 b=32
2380 poke1024+x*40+q,b
2400 nextq,x:goto320
3000 print"sqqqqqqqqqqqqqqqqqqqqqqqqqq"tab(13)"Premi un tasto"
3100 gety$:ify$=""then3100
3200 print"s";:return
4000 print"s          CREATORE DI CARATTERI"
4020 print"qQuesto programma ti aiutera' a disegnare"
4040 print"i caratteri."
4060 print"qUsa i tasti del cursore per spostarti"
4080 print"qnelle 4 direzioni e annerisci i punti"
4100 print"qbattendo un carattere qualsiasi."
4120 print"qPer vedere il carattere che hai"
4140 print"qdisegnato devi premare il RETURN ed"
:print"qattendere."
4150 gosub3000
4160 print"qQuando il carattere e' visualizzato puoi"
4180 print"usare i seguenti tasti:"
4280 print"qrCs per correggere il carattere"
4300 print"qrVs per visualizzare su video i dati"
4320 print"qrSs per stampare su stampante i dati"
4400 gosub3000:return
```

Istogrammi tridimensionali CBM 64

```
10 rem *** istogrammi ***
20 forK=49152to49176:reada:poKeK,a:nextK
30 data169,0,133,251,169,32,133,252,162,32,160,0,168,0,145,251
40 data136,208,251,230,252,202,208,246,96
110 bm=8192
120 poKe53272,peeK(53272)or8
130 poKe53265,peeK(53265)or32
140 fori=1024to2023:poKei,22:next
150 sys49152
160 goto1000
200 x=int(x):y=int(y)
210 ifx<0orx>319then280
220 ify<0ory>199then280
230 p=bm+320*int(y/8)+8*int(x/8)+(yand7)
240 ifer=1then270
250 poKep,peeK(p)or(2↑(7-(xand7)))
260 goto 280
270 poKep,peeK(p)and(255-2↑(7-(xand7)))
280 return
300 sx=sgn(x2-x1):sy=sgn(y2-y1)
310 nx=abs(x2-x1):ny=abs(y2-y1)
320 x=x1:y=y1:gosub200
330 ifny>nxthen390
340 nd=int(nx/2)
350 forK=1tonx:nd=nd+ny
360 ifnd<nxthenx=x+sx:goto380
370 nd=nd-nx:x=x+sx:y=y+sy
380 gosub200:next:goto440
390 nd=int(ny/2)
400 forK=1tony:nd=nd+nx
410 ifnd<nytheny=y+sy:goto430
420 nd=nd-ny:x=x+sx:y=y+sy
430 gosub200:next
440 return
500 forxp=0to100step20
510 x1=xc+xp:y1=yc-xp/2
520 x2=x1-100:y2=y1-50:gosub300
530 next
540 foryp=0to90step15
550 x1=xc-yp:y1=yc-yp/2
560 x2=x1+110:y2=y1-55:gosub300
570 next
580 return
600 forn=0toz-1step2
610 x1=xc+xp-yp:y1=yc-xp/2-yp/2-n
620 x2=x1+xa:y2=y1-ya:gosub300
630 next
640 forn=0toz-1
```

```
650 x1=xc+xp-yp:y1=yc-xp/2-yp/2-n
660 x2=x1-xb:y2=y1-yb:er=1:gosub300
670 next:er=0
680 x1=xc+xp-yp:y1=yc-xp/2-yp/2
690 x2=x1-xb:y2=y1-yb:gosub300
700 x1=x2:y1=y2:y2=y2-z:gosub300
710 x1=x2:x2=x2+xb:y1=y2
720 y2=y2+yb:gosub300
740 forn=0toxb-1
750 x1=xc+xp-yp-n:y1=yc-z-(xp+yp+n)/2
760 x2=x1+xa:y2=y1-ya:er=1:gosub300
770 next:er=0
780 x1=xc+xp-yp:y1=yc-xp/2-yp/2-z
790 x2=x1+xa:y2=y1-ya:gosub300
800 x1=x2:x2=x2-xb:y1=y2
810 y2=y2-yb:gosub300
820 x1=x2:x2=x2-xa:y1=y2:y2=y2+ya
830 gosub300
840 x1=x2:x2=x2+xb:y1=y2:y2=y2+yb
850 gosub300
860 return
1000 xc=160:yc=130:er=0
1010 xa=10:xb=8:ya=5:yb=4
1020 gosub500
1030 forxp=100to0step-20
1040 foryp=90to0step-15
1050 z=int((2+cos(xp/20))*(yp/10+1))
1060 gosub600
1070 next
1080 next
1090 end
```

Onde tridimensionali CBM 64

```
10 rem *** onde tridimensionali ***
20 forK=49152to49176:reada:poKeK,a:nextK
30 data169,0,133,251,169,32,133,252,162,32,160,0,169,0,145,251
40 data136,208,251,230,252,202,208,246,96
110 bm=8192
120 poKe53272,peeK(53272)or8
130 poKe53265,peeK(53265)or32
140 fori=1024to2023:poKei,22:next
150 sys49152
160 goto1000
200 x=int(x):y=int(y)
210 ifx<0orx>319then250
220 ify<0ory>199then250
230 p=bm+320*int(y/8)+8*int(x/8)+(yand7)
240 poKep,peeK(p)or(2↑(7-(xand7)))
250 return
1000 K=π/2000
1010 m=1/sqr(2)
1020 def fna(z)=10*cos(K*(xp*xp+yp*yp))
1030 forxp=-100to100
1040 y1=5*int(sqr(10000-xp*xp)/5)
1050 foryp=y1to-y1step-5
1060 z=fna(sqr(xp*xp+yp*yp))-m*yp
1070 ifyp=y1then1090
1080 ifz<z1then1110
1090 x=160+xp:y=100-int(z/2):gosub200
1100 z1=z
1110 next yp
1120 next xp
```

Linea orizzontale VIC 20

```
10 rem *** linea orizzontale ***
20 poke36869,253
25 poke56,20:poke52,20
30 printchr$(147)
40 fori=0to241
50 poke7680+i,i
60 poke38400+i,6
70 next
100 fori=0to241*8+7
120 poke5120+i,0
140 next
200 y=50:forx=50to150
220 gosub1000:nextx
1000 ba=5120
1020 ri=int(y/8)
1040 co=int(x/8)
1050 li=yand7
1060 bi=7-(xand7)
1080 lo=ba+ri*176+co*8+li
1100 pokelo,(2↑bi)orpeek(lo)
1200 return
```

Sinusoide VIC 20

```
10 rem *** sinusoide ***
20 poke36869,253
30 poke56,20
40 gosub1000
50 gosub2000
70 forx=0to175
80 y=43-int(42*sin(8*π*x/176))
90 gosub3000
100 gosub4000
110 next
120 geta$:ifa$=""then120
130 poke36869,240:poke56,30:poke52,30:clr:printchr$(147):end
1000 rem
1010 printchr$(147)
1020 fori=0to241
1030 poke7680+i,i
1040 poke38400+i,6
1050 next:return
2000 rem
2010 fori=0to241*8+7
2020 poke5120+i,0
2030 next:return
3000 rem
3010 ifx<0orx>175then3040
3020 ify<0ory>87then3040
3030 return
3040 poke36869,240:printchr$(147)
3050 end
4000 rem
4010 u=int(y/8):v=int(x/8)
4020 m=5120+(22*u+v)*8
4030 r=yand7:c=xand7
4040 pokem+r,(2↑(7-c))orpeek(m+r)
4050 return
```

Rettangolo VIC 20

```
1000 rem *** rettangolo ***
1020 poke56,20
1040 gosub1320
1060 poke36869,253
1080 gosub1200
1100 forx=38to138:y=10:gosub1520:nextx
1120 fory=10to70:x=138:gosub1520:nexty
1140 forx=138to38step-1:y=70:gosub1520:nextx
1160 fory=70to10step-1:x=38:gosub1520:nexty
1180 gety$:ify$=""then1180
1190 print"■":poke36869,240:end
1200 rem
1220 printchr$(147)
1240 fori=0to241
1260 poke7680+i,i
1280 poke38400+i,6
1300 next:return
1320 rem
1340 fori=0to241*8+7
1360 poke5120+i,0
1380 next:return
1520 rem
1540 u=int(y/8):v=int(x/8)
1560 m=5120+(22*u+v)*8
1580 r=yand7:c=xand7
1600 pokem+r,(2↑(7-c))orpeek(m+r)
1620 return
```

Disegno cerchi VIC 20

```
10 rem *** disegno cerchi ***"
20 print"{clr}"
40 poke36879,42
50 poke36869,253:poke36867,peek(36867)or128
60 poke55,0:poke56,25:poke51,0:poke52,19
70 clr:s=32768:t=5120
80 fori=0to255*8+7:pokei+t,peek(i+s):next
90 goto170
100 x%=x/8:y%=y/8:p=x%+y%*22+7680
110 q=peek(p):ifq<128then140
120 c=5120+q*8+(yand7)
130 pokec,peek(c)or(2↑(7-(xand7))):return
140 cn=cn+1:s=5120+(127+cn)*8:t=5120+q*8
150 fori=0to7:pokes+i,peek(t+i):next
160 q=127+cn:pokep,q:goto120
170 fori=1to22:poke7680+22*i,93:next
180 poke7680+11*22,107
190 fori=1to21:poke7680+11*22+i,64:next
200 rd=40:forz=0to2*πstep.05:x=cos(z)*rd+80
210 y=sin(z)*rd*1.7+88:gosub100
220 x=cos(z)*rd+90:y=sin(z)*rd*1.7+98:gosub100
230 next
240 geta$:ifa$=""then240
250 poke35879,27:print"{rvs}{←}";:poke36869,240
260 poke56,30
```